

PROJECT AUTHORIZATION NO. HWY-2005-12

under

MASTER AGREEMENT FOR RESEARCH AND TRAINING SERVICES BETWEEN THE NORTH  
CAROLINA DEPARTMENT OF TRANSPORTATION AND  
NORTH CAROLINA STATE UNIVERSITY ON BEHALF OF  
THE INSTITUTE FOR TRANSPORTATION RESEARCH AND EDUCATION  
(Contract No. 98-1783)

**Project Title:** Benchmarking for North Carolina Public Transportation Systems

**Formal Statement of Work:** See attached proposal

**Period of Performance:** January 1, 2005-December 31, 2005

**Budget Authorization:**

|           |          |
|-----------|----------|
| FY 04-05: | \$34,168 |
| FY 05-06: | \$33,056 |
| Total:    | \$67,224 |

**Property to be Furnished by the Department:** None

**Key Personnel:** Thomas J. Cook, Principal Investigator  
Jud Lawrie, Co-Principal Investigator

**Project Monitor:** Mr. Richard Lakata, P.E.

**Additional Terms and Conditions:** Research Project Guidelines as posted on ITRE's website at <http://itre.ncsu.edu/research/ongoingguidelines.htm>.

IN WITNESS WHEREOF, the parties hereto have executed this Project Authorization as of  
\_\_\_\_\_, 2004.

NORTH CAROLINA STATE UNIVERSITY

NORTH CAROLINA DEPARTMENT  
OF TRANSPORTATION

BY: \_\_\_\_\_  
Principal Investigator

BY: \_\_\_\_\_

BY: \_\_\_\_\_  
N. C. State University

BY: \_\_\_\_\_  
Director of ITRE

|                 |   |
|-----------------|---|
|                 | FY 2005   |
|                 | NCDOT   |
|                 | <b>Research Proposal</b>  |
| Subcommittee:   | Planning and Environment  |
| Project Title:  | Research Project Number: 2005-12<br><b>Benchmarking for North Carolina Public Transportation Systems</b>  |
| Submittal Date: | April 16, 2004  |
| Organization:   | Public Transportation Group<br>Institute for Transportation Research and Education<br>North Carolina State University   |
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## **Executive Summary**

The North Carolina Department of Transportation, Public Transportation Division (NCDOT/PTD) desires recommendations on benchmarking of public transportation systems. This desire is driven by the need to ensure that transit systems meet the needs of their communities, and that they offer a variety and quality of services that meet the public demand.

Benchmarking is a process to establish standards, targets and/or best practices in regard to performance measurement. Performance measures are of most use when they can be compared to something else. In benchmarking, comparisons are usually made with one or more of the following: 1) some kind of industry standards; 2) appropriate organizational goals or targets; 3) the performance of a peer group; or, 4) the “best practices” of other similar organizations.

This research study will provide three primary products:

- 1) A set of selected benchmarks for public transit systems, particularly efficiency and effectiveness benchmarks that are commonly used by other transit systems or benchmarks that specifically relate to important customer satisfaction factors identified as part of the study.
- 2) A recommended benchmarking process that can be used by public transit systems in North Carolina to identify areas of low performance and then institute steps to improve it.
- 3) Implementation of an Internet listserv that will provide a communications method to share and disseminate information on, and questions about, benchmarking activities and best practices.

To achieve these important objectives, the proposed scope of work will include a number of specific tasks that are detailed on succeeding pages.

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## **Research Plan**

### Introduction and Background

The North Carolina Department of Transportation, Public Transportation Division (NCDOT/PTD) desires recommendations on a benchmarking process for public transportation systems. This desire is driven by the need to ensure that transit systems meet the needs of their communities, and that they offer a variety and quality of services that meet the public demand. Further, it is believed that there is not currently an adequate understanding of the public's perceived quality of transit services.

Performance measurement is a precursor to benchmarking, and takes measurements of an organization's activities for comparison and improvement. Performance measures are of most value when they can be compared to something else. Benchmarking is a process by which appropriate comparisons can be made, usually with one or more of the following: 1) some kind of industry standards; 2) appropriate organizational goals or targets; 3) the performance of a peer group; or, 4) the "best practices" of other similar organizations.

This research study will build upon the findings from the current NCDOT research study, "*Use of Performance Standards and Measures for Public Transportation Systems*". That study will result in the development of performance measures for North Carolina transit systems; this study will build upon the performance measures in order to incorporate effective standards or benchmarks, and to share best practices.

### Research Objectives

Specific objectives to be addressed in this project will include:

- Determining the public's perceived quality of public transportation services
- Identifying appropriate benchmarking topics
- Identifying benchmarking role models within the transit community
- Establishing common transit system interest groups to share processes and ideas
- Developing and implementing action plans for achieving project recommendations

### Literature Review

ITRE staff has conducted a preliminary search of the literature using TRIS and other sources. Results from that search are contained in Appendix A. A more comprehensive literature review will be conducted in Task 2 of the project.

### Research Methodology

We will conduct a comprehensive review of the literature on benchmarking in general, as applied in both transit and other sectors. In particular, we will review available literature on the subject of market research and customer satisfaction in order to identify the key factors that drive the public's use of and satisfaction with public transportation services. In addition, we will review the findings of any recent market or rider survey research done by North Carolina transit systems. We will then identify and recommend a set of selected efficiency and effectiveness benchmarks that are most commonly used in public transit, and/or that reflect important customer satisfaction factors.

To develop an effective benchmarking process, the research study will review use of performance measures and benchmarks by selected metropolitan and rural public transportation systems. Moreover,

the performance benchmarking process must further the goals of the Transit 2001 Commission Report as explained in the section below on “Anticipated Results and Significance” (p. 7).

Finally, we propose to utilize an Internet listserv to enable continued communication among North Carolina transit professionals, and to facilitate sharing of best practices.

### Work Plan and Itemized Tasks

The overall work plan will include the following specific tasks and activities.

#### *Task 1. Identify overall goals, objectives, issues, and activities to be accomplished.*

Develop, in concert with NCDOT/PTD staff, the desired outcomes to be accomplished from benchmarking important activities of transit systems including:

- 1.1 Through discussions with NCDOT/PTD staff and an advisory committee, develop concurrence on overall goals and objectives to be accomplished through public transportation benchmarking.
- 1.2 Determine the specific criteria to be considered in developing a benchmarking process.
- 1.3 Determine transit system groupings and characteristics to be addressed/included in the process.

#### *Task 2. Conduct general literature search.*

Gather and review applicable literature on benchmarking, both in general and as applied to the transit industry, including both fixed-route and demand-responsive services. This task will include the following subtasks:

- 2.1 Review the general literature on benchmarking processes.
- 2.2 Examine recent transit benchmarking experience in Europe, particularly in regard to the BEST Project (Benchmarking in European Service of public Transport).
- 2.3 In addition to benchmarks that pertain to such typical performance factors as efficiency and effectiveness, benchmarks that pertain to the “need” for transit will be reviewed. This will uncover potential indicators of need that can be used to identify areas where transit service should be a priority. For example, population density, job density, and the number of transportation disadvantaged individuals in the area are potential indicators of need.
- 2.4 Summarize tasks into a Technical Memorandum.

#### *Task 3. Review customer satisfaction literature and surveys; and develop and administer customer satisfaction surveys.*

Review relevant research in regard to customer satisfaction in order to understand the public’s perception of the quality of transportation services. Gather input from transit riders at selected urban, rural, and regional transit systems on their satisfaction with current transit services. Gather input from North Carolinians who do not use transit regularly in order to determine their perceptions of public transportation and why they don’t use it.

- 3.1 Review customer satisfaction literature.
- 3.2 Locate and analyze market research or customer satisfaction surveys done in North Carolina.
- 3.3 Develop survey instrument.
- 3.4 Determine locations at which the survey will be administered.
- 3.5 Determine procedure to gather input from individuals who do not use transit.
- 3.6 Conduct surveys. Analyze data and summarize findings.
- 3.7 From this research, determine the key factors that influence the public’s perception and use (or non-use) of public transportation.

#### *Task 4. Develop and administer surveys of other important transit system stakeholders.*

In addition to developing a better understanding of typical transit customers, i.e., transit users, the research team will conduct a parallel activity to survey other important stakeholders of transit. For

example, the social or human service agencies that are served by some transit agencies may have a valuable perspective on possible benchmarking areas. Also, “internal customers” such as the boards and management staffs of transit agencies may contribute other relevant ideas. Subtasks will include:

- 4.1 Develop survey instrument/interview guide.
- 4.2 Determine agencies/organizations to be surveyed/interviewed.
- 4.3 Conduct surveys/telephone interviews.
- 4.4 Conduct data analysis.
- 4.5 Summarize findings.

*Task 5. Determine key areas to benchmark.*

From the research conducted in Tasks 3 and 4, identify key areas to be benchmarked. Subtasks will include:

- 5.1 Determine areas in which customer satisfaction reveals the greatest improvements are needed.
- 5.2 Articulate the identified benchmark areas in a Technical Memorandum.

*Task 6. Research benchmarking experience.*

Research the experience of selected transit systems in North Carolina and other states in benchmarking their activities, including opportunities and constraints from using benchmarks, reasons for adopting/not adopting benchmarks, and lessons learned. Subtasks will include:

- 6.1 Develop survey instrument for use in gathering information from transit systems that have experience in using benchmarks.
- 6.2 Select transit systems to be surveyed, and develop a contact list.
- 6.3 Conduct surveys of transit systems and identify commonly used benchmarks and exemplary benchmarking practices.
- 6.4 Synthesize findings into a Technical Memorandum.

*Task 7. Establish a benchmarking methodology for use in North Carolina.*

Develop a benchmarking process to be used by North Carolina transit systems to identify areas of low performance and then institute actions to improve it.

- 7.1 Identify necessary procedures to conduct a benchmarking process to include setting of goals or targets, making comparisons with peer groups, and identifying best practices to emulate.
- 7.2 Provide guidelines for creating appropriate peer groups for comparison and information sharing, and for implementing best practices.
- 7.3 Synthesize findings and recommended procedures in a draft benchmarking Guidebook.
- 7.4 Provide draft Guidebook to the Research Study Panel, NCDOT staff, and selected local transit operators for review and comment.
- 7.5 Produce and provide final Guidebook incorporating comments.

*Task 8. Develop a means for North Carolina transit professionals to locate and share information on benchmarking and best practices.*

Develop a means of communication for North Carolina transit system managers and staff to locate and share benchmarking and best practices in use in order to disseminate information on potential improvements to business practices and increase the overall performance of North Carolina transit systems.

- 8.1 Develop and implement an Internet listserv to which state DOT staff, and transit management and staff may subscribe to share information on, and questions about, benchmarking and best practices. It may be possible to utilize existing NCDOT rural and urban listservs for this purpose.
- 8.2 Provide guidance on how to utilize the listserv in order to ensure that it will be used effectively. This could be done through email communications, and presentations at statewide conferences such as the NCPTA Annual Conference.

- 8.3 Through a follow-on contract, maintain the listserv and provide NCDOT staff with suggestions for areas in which further guidance would be useful. If the NCDOT rural and urban listservs are utilized for this task, this activity will not be necessary.

*Task 9. Prepare Final Report.*

Develop a final draft report summarizing all findings, conclusions and recommendations. Submit draft to the Research Study Panel, NCDOT staff, and selected local transit operators for review and comment. Incorporate comments and produce final report. (Note: the Final Report will reference but not include the Guidebook developed in Task 6.)

- 9.1 Prepare draft report and provide to reviewers for review.
- 9.2 Provide review period.
- 9.3 With guidance from NCDOT/PTD staff, incorporate comments from reviewers into a final report and provide to NCDOT.

### **Anticipated Results and Significance**

This project will complement and build upon the current FY 2004 NCDOT Research Project—"Use of Performance Standards and Measures in Public Transportation Systems." Three primary products are anticipated:

- 1) A set of selected benchmarks for public transit systems, particularly commonly used efficiency/effectiveness benchmarks, and benchmarks that relate to the key customer satisfaction factors identified in Task 3. These benchmarks will address several categories of public transportation systems to reflect real differences in operations, operating environments, and local capabilities, rather than attempt to be a "one size fits all" series of standards.
- 2) A recommended benchmarking process that can be used by public transit systems in North Carolina to identify areas of low performance and then institute steps to improve them. A guidebook will be developed that will provide step-by-step details to help public transit systems develop and implement such a process
- 3) An Internet listserv that will provide a communications method to share and disseminate information on, and questions about, benchmarking activities and best practices. This will assist local operators to implement practices to increase their efficiency and effectiveness.

These products will assist the NCDOT Public Transportation Division in increasing the effectiveness and efficiency of public transportation services throughout the state in an equitable manner, while recognizing transit systems that perform at a superior level.

Anticipated benefits from the project include:

- Increasing the utilization of public transportation services
- Strengthening the focus on customer needs and expectations
- Creating a learning process based on perceived quality
- Establishing a professional network of public transportation peers across the state
- Promoting public transportation based on open dialogue and the positive development of services

The research products will also help NCDOT to achieve part of the mission for urban and rural transit services identified in the Transit 2001 Commission Report, viz. to provide *...efficient, safe, convenient and cost-effective public transportation that is an integral part of the overall transportation system.*

## **Recommendations for Implementation and Technology Transfer**

One of the ways to help assure acceptance and implementation of study recommendations is to allow participation by those who will be affected. For this reason, the design of this study includes the creation of an Advisory Committee composed of key public transportation stakeholders in the state. (One possibility to be discussed would be to simply continue the Advisory Committee that has already been created for the FY 2004 Performance Measurement project.) This committee will be involved throughout the study to help develop and review findings and recommendations. We also propose to make a presentation at and consult with community transportation systems at the fall 2004 Community Transportation System conference, much as we did in regard to the current Performance Measurement project at the fall 2003 conference. In addition, if the timing is appropriate and suitable arrangements can be made, preliminary study results will be shared with public transportation providers in the state at a workshop session at the Annual Conference of the NC Public Transportation Association in the spring of 2005.

One key product of the project is the development of a guidebook that describes a process to be used by transit systems to identify areas of low performance and then institute actions for improvement. The intention is to provide detailed guidance to the systems that will allow them to implement and use appropriate benchmarking processes. Another key product is the creation of an appropriate Internet listserv that will allow all transit systems in North Carolina to regularly communicate about benchmarking and to share ideas and best practices.

ITRE sees a potential future role in the implementation of benchmarking processes in the state by working with individual transit systems to provide technical assistance and support.

## **Resources to be supplied by NCDOT**

Minimal resources will be needed. Some staff time to meet with research team and/or to provide relevant materials or contacts is anticipated.

## **Equipment and Facilities**

Administered by North Carolina State University and located on Centennial Campus, ITRE has a comprehensive array of quality, up-to-date equipment and facilities. The equipment and facilities that are envisioned to support this project include:

PTG Library – The Public Transportation Group (PTG) Library houses a comprehensive, up-to-date collection of several thousand periodicals, academic journals, research studies, handbooks, catalogues, and other publications related to every aspect of public transportation.

Information Technology – ITRE has high-speed Internet access, an integrated computer network, and a comprehensive variety of software applications.

## **Time Requirements**

The period of performance for this research study is January 1, 2005 to December 31, 2005. An estimated schedule of activities follows:

| <b>Task</b>   | <b>Activity</b>   | <b>Deadline/Time Period</b>   | <b>Deliverable/Product and Due Date</b>  |
|---|---|---|--|
| 1. Identify overall goals, objectives, issues, and activities to be accomplished.                             | <ul style="list-style-type: none"> <li>• Develop goals and objectives.</li> <li>• Determine criteria to be considered.</li> <li>• Determine system groupings and characteristics to be considered.</li> </ul>   | <ul style="list-style-type: none"> <li>• January-February 2005</li> </ul> |  |
| 2. Conduct general literature search.   | <ul style="list-style-type: none"> <li>• Review general literature on benchmarking.</li> <li>• Examine European benchmarking experience, esp. "BEST".</li> <li>• Review potential indicators of "need" for transit.</li> <li>• Produce Technical Memorandum.</li> </ul>   | <ul style="list-style-type: none"> <li>• January-March 2005</li> </ul>    | <ul style="list-style-type: none"> <li>• Technical Memorandum #1, March 31, 2005.</li> </ul> |
| 3. Review customer satisfaction literature and surveys; develop and administer customer satisfaction surveys. | <ul style="list-style-type: none"> <li>• Review customer satisfaction literature.</li> <li>• Locate/analyze NC customer satisfaction surveys.</li> <li>• Develop survey instrument and determine survey locations.</li> <li>• Determine ways to get input from non-transit users.</li> <li>• Conduct surveys, analyze data.</li> <li>• Determine factors that influence public perception and summarize findings</li> </ul> | <ul style="list-style-type: none"> <li>• January-March 2005</li> </ul>    |  |
| 4. Develop and administer surveys of other stakeholders.  | <ul style="list-style-type: none"> <li>• Develop survey instrument/guide.</li> <li>• Determine agencies and organizations.</li> <li>• Conduct surveys and interviews.</li> <li>• Summarize findings.</li> </ul>   | <ul style="list-style-type: none"> <li>• March 2005</li> </ul>            |  |

| <b>Task</b>   | <b>Activity</b>  | <b>Deadline/Time Period</b>  | <b>Deliverable/Product and Due Date</b>   |
|---|--|--|---|
| 5. Determine key areas to benchmark.  | <ul style="list-style-type: none"> <li>Determine areas where greatest improvements are needed.</li> <li>Produce a Technical Memorandum of identified benchmark areas..</li> </ul>  | <ul style="list-style-type: none"> <li>April-May 2005</li> </ul>                           | <ul style="list-style-type: none"> <li>Technical Memorandum # 2, May 31, 2005.</li> </ul>   |
| 6. Research benchmarking experience.  | <ul style="list-style-type: none"> <li>Develop survey instrument.</li> <li>Select systems to survey.</li> <li>Conduct surveys; identify common benchmarks, best practices.</li> <li>Produce Technical Memorandum.</li> </ul>   | <ul style="list-style-type: none"> <li>May-July 2005</li> </ul>                            | <ul style="list-style-type: none"> <li>Technical Memorandum #3, July , 2005</li> </ul>      |
| 7. Establish a benchmarking methodology for use in North Carolina.  | <ul style="list-style-type: none"> <li>Identify necessary benchmarking procedures.</li> <li>Provide guidelines re: peer groups.</li> <li>Draft benchmarking Guidebook.</li> <li>Circulate Guidebook for review and comment.</li> <li>Produce final Guidebook.</li> </ul> | <ul style="list-style-type: none"> <li>August-November 2005</li> </ul>                     | <ul style="list-style-type: none"> <li>Benchmarking Guidebook, November 30, 2005</li> </ul> |
| 8. Develop a means for North Carolina transit professionals to locate and share information on benchmarking and best practices. | <ul style="list-style-type: none"> <li>Implement Internet listserv for sharing information, best practices.</li> <li>Provide guidance on listserv use.</li> <li>Maintain the listserv as needed.</li> </ul>  | <ul style="list-style-type: none"> <li>November-December 2005</li> <li>On-going</li> </ul> | <ul style="list-style-type: none"> <li>Functioning listserv, December 15, 2005.</li> </ul>  |
| 9. Prepare Final Report.  | <ul style="list-style-type: none"> <li>Prepare draft Final Report.</li> <li>Circulate Report for review and comment.</li> <li>Produce Final Report.</li> </ul>   | <ul style="list-style-type: none"> <li>November-December 2005</li> </ul>                   | <ul style="list-style-type: none"> <li>Final Report, December 31, 2005.</li> </ul>          |

## **Qualifications and Accomplishments of Researchers**

### ***Thomas J. Cook***

Thomas Cook is Co-Director of the Public Transportation Group (PTG), a research group that provides technical assistance, research, and training activities for sponsors representing the following transportation modes: public transit, passenger rail, bicycle and pedestrian, and taxicab and limousine.

Mr. Cook has served as principal investigator on many projects, for sponsors including the North Carolina Department of Transportation, the Ohio Department of Transportation, and the Taxicab, Limousine and Paratransit Association (TLPA). He is a member of the Transportation Research Board (TRB) Paratransit Committee, and has been a contributing author to several Transit Cooperative Research Program (TCRP) transit studies. He is currently a Principal Investigator for the FY 2004 NCDOT research project investigating the use of performance measures to allocate public transportation funding.

Recent projects have included a study of the potential consolidation of existing public transit systems into regional public transportation systems in both rural and urban areas of North Carolina, an investigation of the feasibility of developing and implementing a statewide North Carolina transit system accreditation program, and research on the feasibility of establishing passenger rail service between Raleigh and Wilmington, North Carolina. In addition, Mr. Cook has managed projects to provide technical assistance to the Ohio Department of Transportation for the implementation of advanced technologies, and to develop a Policies and Procedures Manual for the NCDOT Rail Division Engineering and Safety Branch.

Mr. Cook holds a Master of Regional Planning degree from the University of North Carolina at Chapel Hill.

### ***Judson J. Lawrie***

Jud Lawrie is a Sr. Research Associate with ITRE's Public Transportation Group. While at ITRE, Mr. Lawrie has participated in three major public transportation projects: 1) a study of the potential for regionalizing public transportation systems in North Carolina; 2) a project for the Transportation Cooperative Research Program (TCRP) concerning strategies for coordinating specialized transportation services for the "transportation disadvantaged"; and, 3) a project to develop a Human Resources Toolkit of effective ways to recruit, hire and retain transportation personnel in community transportation systems in the state. He is currently working on the FY 2004 NCDOT research project regarding the use of performance measures by public transportation systems, and on a case study of the economic impact of bicycling at the Outer Banks.

Prior to joining ITRE, Mr. Lawrie served in the public transportation arena in Illinois for over 25 years. He was the first director of the Illinois Office of Mass Transportation that developed and administered a statewide program of operating and capital grants for public transportation. He next worked for the Chicago Regional Transportation Authority for five years and directed the implementation of a multi-million dollar program of new suburban bus service--100 new routes and 70 expanded routes in two years. He also directed the development of a major new program of paratransit services (28 systems), and conducted a productivity review of all existing suburban bus services. Later, he worked for the Chicago Transit Authority (CTA) for 15 years as Budget Director, Vice President of Corporate Development, and Deputy Executive Director of Budget, Planning and M.I.S.

Mr. Lawrie has participated in three projects that are particularly relevant to this one:

- The suburban bus productivity study mentioned above that examined the efficiency and effectiveness of the Chicago suburban bus system.
- The use of performance measures developed from federal operating data (then “Section 15”) to analyze the CTA’s performance in relation to a peer group and in relation to its previous years’ performance.
- The incorporation of a system of performance measures into the CTA’s budgeting process.

Mr. Lawrie earned a BBA from Baylor University, an MBA from the Graduate School of Business, University of Chicago, and a Certificate in Advanced Studies in Organization Development, Loyola University, Chicago.

### Other Commitments of Researchers

Current commitments of the research team are as follows:

| <b>Team Member</b>    | <b>Project—Sponsor</b>   | <b>Hours</b> | <b>End Date</b> |
|-----------------------|--|--------------|-----------------|
| <i>Thomas J. Cook</i> | Project PL-01—NCDOT FY 04 Research Program   | 300          | 6/30/04         |
|                       | Phase VI Tech. Assist.—NC DOT Rail Division  | 100          | 12/31/03        |
|                       | Rail Intern—NC DOT Rail Division   | 45           | 6/30/04         |
|                       | Transportation Research Board, Transit Cooperative Research Program (TCRP) Project H-30: Strategies to Increase Coordination of Transportation Services for the Transportation Disadvantaged | 125          | 1/15/04         |
|                       | <b>Total</b>   | <b>670</b>   |                 |
| <i>Jud Lawrie</i>     | Project PL-01—NCDOT FY 04 Research Program   | 300          | 6/30/03         |
|                       | TCRP Project H-30  | 120          | 1/15/04         |
|                       | Chicago Metropolis 2020  | 120          | 3/31/04         |
|                       | <b>Total</b>   | <b>540</b>   |                 |

### Cited Publications by Proposing Researchers

- 1) *North Carolina Department of Transportation Research Project 2002-11: Regionalizing Public Transportation Services*, ITRE, 2002.
- 2) *A Statewide Accreditation System for North Carolina Transit Systems*, ITRE, 2002.
- 3) *Final Report: Community Transportation Services Alternatives Analysis*, ITRE Transit Operations Group, April 30, 1997 (for NCDOT, PTD).

Findings and recommendations from the “*Use of Performance Standards and Measures for Public Transportation Systems*” project currently in progress by ITRE will be added, as available.

## Appendix A

### Preliminary Literature Review

#### Selected References:

- 1) AB Storstockholms Lokaltrafik, *Benchmarking in European Service of Public Transport: State of the Art Report*, Stockholm, Sweden, 2002.
- 2) Ammons, David N., *Municipal Benchmarks: Assessing Local Performance and Establishing Community Standards*, Sage Publications, Thousand Oaks, CA, 1996.
- 3) Dessouky, Maged, Kurt Palmer, and Tamer Abdelmaguid, *Benchmarking Best Practices of Demand Responsive Transit Systems*, University of California, Berkeley, CA, 2003.
- 4) European Committee for Standardization, *Transportation—Logistics and Services—Public Passenger Transport—Service Quality Definition, Targeting and Measurement*, Brussels, Belgium, 2002.
- 5) Fielding, G.J., *Transit Performance Evaluation in the USA*, Transportation Research Part A, Volume 26, No. 6, pp. 483-491, Washington, DC, 1992.
- 6) Fielding, G.J., *Managing Transit Strategically*, Jossey-Bass, San Francisco, 1987.
- 7) Foote, P.J., D.G. Stuart, and R. Elmore-Yalch., *Exploring Customer Loyalty as a Transit Performance Measure*, Transportation Research Record No. 1753, Transportation Research Board, Washington, DC, 2001.
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- 9) Furth, P. G., Transit Cooperative Research Program., *Data analysis for bus planning and monitoring*, National Academy Press, Washington, D.C., 2000.
- 10) Hensher, D.A., P. Stopher, and P. Bulloch, *Service Quality—Developing a Service Quality Index in the Provision of Commercial Bus Contracts*, Elsevier Science, Limited, Kidlington, Oxford, England, 2003.
- 11) Karlaftis, M. and P. McCarthy, *Operating subsidies and performance in public transit: an empirical study*, Transportation Research Part A, Volume 32, No. 5, pp. 359-375, 1998.
- 12) Karlaftis, M. and K. Sinha, *Performance-based transit operating subsidy allocation: a before and after study*. Journal of Public Transportation, Volume 1, No. 2 pp.1-22, 1997.
- 13) Keehley, P., S. Medlin, S. MacBride, and L. Longmire, *Benchmarking for Best Practices in the Public Sector*, Jossey-Bass, San Francisco, 1997. Kittelson & Associates, Transit Cooperative Research Program, *TCRP Report 88: A Guidebook for Developing a Transit Performance-Measurement System*, 2003.
- 14) Radow, L. and C. Winters. *Rural transit performance measurement*. <http://www.ctaa.org/ntrc/rtap/pubs/ta/perform2.asp?printview=yes>, 2002.
- 15) Rossetti, M.D., T-Y. Sang, and T. Collins, *Online Benchmarking for Transportation Providers*, ITS America, Washington, DC, 2002.
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- 17) Transportation Research Board, *Performance Measures to Improve Transportation Systems and Operations: Report of a Conference*, National Academy Press, Washington, D.C., 2001.
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The Florida Department of Transportation has contracted with the University of South Florida to develop benchmark rankings for transit systems in the United States. Tara Bartee is the project manager, and the project is scheduled to end on 12/31/2003. We will track the outcome of this project, and request a copy of the final report, once it is available.